

June 5, 2006

Dear Colleague:

RE: Request for Proposals for Lake Characterization Plan Grants

The New Jersey EcoComplex of Rutgers, The State University of New Jersey (NJEC), under contract with the Division of Watershed Management (DWM) of the New Jersey Department of Environmental Protection (Department) is pleased to announce a request for proposals (RfPs) for Lake Characterization Plan Grants to be completed for specific eutrophic lakes for which a total maximum daily load (TMDL) has been approved by the United States Environmental Protection Agency. The Department's DWM is responsible for developing TMDLs to identify all the sources of a pollutant of concern for which surface water quality standards are not being met and set load reductions needed to meet surface water quality standards. TMDLs are required, under Section 303(d) of the federal Clean Water Act, to be developed for waterbodies that cannot meet surface water quality standards after the implementation of technology-based effluent limitations.

In September 2002, the Department and the US Environmental Protection Agency (EPA) signed a memorandum of agreement that formalized New Jersey's commitment to establish TMDLs. The DWM will adopt the TMDLs into the applicable Water Quality Management Plans. The purpose of a lake characterization is to provide a qualitative evaluation of a lake's ecology. A Lake Characterization Plan serves as a diagnostic tool to determine the specific water quality objectives and restoration approaches needed for a particular lake to achieve a TMDL. The pollutant of concern for the eutrophic lake TMDLs is phosphorus. Phosphorus is an essential nutrient for plants and algae, but is considered a pollutant when it stimulates excessive growth of aquatic plants and algae (primary production). As these aquatic plants and algae decay, oxygen levels in a lake are depleted, resulting in possible fish kills. This process of eutrophication compromises the overall ecological health of the lake.

TMDLs are established based on best available information. Nevertheless, for many lakes, the TMDLs have identified the need to update loading information. For example, some of the Lake TMDL documents detail the need to establish phosphorus contributions for factors such as internal load and septic systems. Only with a comprehensive Lake Characterization Plan can the proper restoration measures be determined that, upon implementation, will achieve phosphorus reduction and reduce primary productivity.

The NJEC offers you the opportunity to review supporting information on the lakes for which proposals are being requested to determine your capabilities and interest in conducting lake characterizations for the lakes listed in the enclosed RfP. Supporting lake documents such as Lake Diagnostic Feasibility Studies may be found on the DWM web page at [www.state.nj.us/dep/watershedmgt](http://www.state.nj.us/dep/watershedmgt) under Publications "Lake Resource Documents" as well in the New Jersey Environmental Digital Library at <http://njedl.rutgers.edu/njdlib/index.cfm> type in "lakes" under Quick Searches.

Enclosed with this letter are both the RfP and the procedures for submittal of proposals in response to the RfP. Adherence to these procedures is required. If interested in pursuing the development of a Lake Characterization Plan, primary investigators must submit their proposals by July 5, 2006. Please note that some lakes for which proposals are being sought have an asterisk next to their name, I encourage those investigators interested in submitting proposals for these lakes to have early conversations with the NJEC and DWM contact persons. Such discussion should help to ensure that the proposal being developed would best fulfill the needs of the Department. Investigators are encouraged to prepare proposals in support of multiple projects for lakes that may be geographically close to another to support economies of scale.

When considering the information enclosed in the following RfP, please be aware that the Department has entered into a contractual agreement with the New Jersey EcoComplex of Rutgers University for peer review of the proposals and for executing the subcontracts. The subcontract requires the Investigator(s) to submit periodic technical reports, as well as make presentations to and consult with NJEC, the Department, watershed advisory committees and other audiences as appropriate throughout the contract period. At a minimum, this will include presentations to the NJEC and to the Department at the midpoint and conclusion of the work period. Investigators may also be asked to participate in the Department's technology transfer program through the Division of Science, Research and Technology. Investigators should incorporate the necessary technology transfer related items, the costs of travel, meetings and information sharing into their budget, as warranted.

An announcement for this RfP appeared in the June 5<sup>th</sup> New Jersey Register stating that the deadline for full proposal submittal is July 5, 2006. If you have any questions regarding the enclosed RfP, please do not hesitate to contact Ms. Lisa Galloway Evrard, Rutgers Program Associate at [evrard@rci.rutgers.edu](mailto:evrard@rci.rutgers.edu) or Ms. Kimberly Cenno, NJDEP Project Manager at [kimberly.cenno@dep.state.nj.us](mailto:kimberly.cenno@dep.state.nj.us).

Sincerely,

Christopher C. Obropta, Ph.D., P.E..  
Principal Investigator

enclosure

## **Request for Proposals for Work Supporting the New Jersey Department of Environmental Protection in Development of Lake Characterization Plans**

The New Jersey EcoComplex of Rutgers, The State University of New Jersey (NJEC), under contract with the New Jersey Department of Environmental Protection (Department) is pleased to announce a request for proposals (RfPs) for work supporting the Department in developing Lake Characterization Plans. At least \$560,905 is available in grant funding to perform this work; however due to the uniqueness of each lake and associated workload, an “average” funding level per lake cannot be discerned at this time. The lakes included in this RfP were impaired for phosphorus, and are the subject of total maximum daily loads (TMDLs) reports that were approved by the United States Environmental Protection Agency (EPA) Region 2. This RfP serves to realize the implementation plan identified by the Department in each of the TMDL reports listed under Supporting Documents in Appendix A.

The Department is in the process of adopting each of the TMDLs to the appropriate water quality management plan(s) and does not anticipate that there will be significant, if any change to TMDL implementation plans upon its final adoption. A copy of a TMDL report may be downloaded from the Department’s web page at [www.state.nj.us/dep/watershedmgt/tmdl.htm](http://www.state.nj.us/dep/watershedmgt/tmdl.htm).

As part of its contractual agreement with the Department, the NJEC requests and reviews proposals for TMDL work, and is responsible for execution and administrative oversight of subcontracts ultimately approved by the Department. Subcontracts executed for selected proposals in response to this RfP will require, among other things, that the Investigator(s) submit periodic technical reports addressing the particular research outputs agreed upon through the Scope of Work. The Investigator(s) will be required to make presentations to and consult with the Department, NJEC, watershed advisory committees and other audiences as appropriate throughout the contract period. The Investigator(s) should incorporate the costs of monitoring (including contingencies due to, for instance, unanticipated weather events and/or drought), Quality Assurance Performance Plan preparation, travel, meetings (3 to 5) and information sharing into their contract budgets, as warranted.

Subcontractors engaged by the NJEC pursuant to its contractual agreement with the Department will remain under contract until 60 days after the Department's adoption of the TMDL or other restoration strategy as a Water Quality Management Plan amendment pursuant to N.J.A.C. 7:15, unless otherwise advised of litigation support needs warranting a contract modification. Under this contractual provision, the subcontractor will be required to provide expert testimony supporting their work products in the event of litigation brought against the Department resulting from such work products.

In order to promote cost benefit savings Investigator(s) are encouraged if possible to combine projects and to submit one proposal that details the requirements and budget for each individual Lake Characterization Plan. Upon review of the proposals, the Department and NJEC may request a meeting with the Investigator(s) and a presentation. Note: Costs associated with preparing and revising the proposal shall be incurred by the Investigator(s) and are not eligible

for reimbursement under this RfP. The Investigator(s) are directed to incorporate findings from the approved TMDLs, Phase I Lake Diagnostic Studies, Department funded lake studies through Sections 319(h) and 604(b) funding and any other supporting lake documents into their proposals. Diagnostic-Feasibility studies were completed previously under the Department's Clean Lakes Program and may be downloaded at [www.state.nj.us/dep/watershedmgt](http://www.state.nj.us/dep/watershedmgt) under Publications "Lake Resource Documents" or from the New Jersey Environmental Digital Library at <http://njedl.rutgers.edu/njdlib/index.cfm> type in "lakes" under Quick Searches.

**Lake Characterizations for which Proposals are being Requested:**

Name of Lake	Watershed Management Area	County	Lake Owner
Cranberry Lake	WMA 1	Sussex County	State
Clove Acre Lake*	WMA 2	Sussex County	Municipal
Greenwood Lake*	WMA 3	Passaic County	State & Private
Verona Park Lake*	WMA 4	Essex County	County
Lincoln Park Lake	WMA 5	Hudson County	County
Overpeck Lake	WMA 5	Bergen County	County
Echo Lake	WMA 7	Union County	County
Round Valley Recreational Area	WMA 8	Hunterdon	State
Davidsons Mill Lake	WMA 9	Middlesex County	County
DeVoe Lake	WMA 9	Middlesex County	Municipal
Manalapan Lake*	WMA 9	Middlesex County	County
Topenemus Lake	WMA 9	Monmouth County	Municipal County
Deal Lake*	WMA 12	Monmouth County	Municipal & Private
Franklin Lake	WMA 12	Monmouth County	Municipal
Pohatcong Lake*	WMA 13	Ocean County	Municipal & Private
Hammonton Lake	WMA 14	Atlantic County	State & Municipal & Private
Lake Absegami	WMA 14	Burlington County	State
Sylvan Lakes	WMA 14	Burlington County	Municipal & Private
New Brooklyn Lake	WMA 15	Camden County	County
Dennisville Lake	WMA 16	Cape May County	Municipal
Lily Lake	WMA 16	Cape May County	State
Burnt Mill Pond	WMA 17	Cumberland County	Municipal
Giampietro Lake	WMA 17	Cumberland County	Municipal
Mary Elmer Lake	WMA 17	Cumberland County	Municipal

Memorial Lake	WMA 17	Salem County	
Sunset Lake	WMA 17	Cumberland County	Municipal & Private
Bell Lake	WMA 18	Gloucester County	Municipal
Bethel Lake	WMA 18	Gloucester County	
Blackwood Lake	WMA 18	Camden/Gloucester Counties	Municipal & Private
Cooper River Lake	WMA 18	Camden County	Municipal
Evans Pond/ Wallworth Lake	WMA 18	Camden County	County
Harrisonville Lake	WMA 18	Gloucester and Salem Counties	State FG &W
Kirkwood Lake	WMA 18	Camden County	Municipal
Strawbridge Lake	WMA 18	Burlington County	Municipal
Woodbury Lake	WMA 18	Gloucester County	
Sylvan Lakes	WMA 20	Burlington County	Municipal & Private

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*\*This lake is the subject of an existing Department funded project that includes data collection, please contact NJEC to discuss what additional data is still needed to complete a lake characterization.*

Sublist 5 of the State of New Jersey's 2002 and 2004 *Integrated List of Waterbodies* identified the list of above lakes as being impaired for phosphorus, as evidenced by elevated total phosphorus (TP), elevated chlorophyll-*a*, and/or macrophyte density that impairs recreational use (a qualitative assessment). Total phosphorus is the pollutant of concern, since this "independent" causal pollutant results in "dependent" responses in chlorophyll-*a* concentrations and/or macrophyte density. TMDLs alone are not sufficient to restore eutrophic lakes. The TMDL establishes the required nutrient reduction targets and provides the regulatory framework to effect those reductions. However, the nutrient load only affects the eutrophication potential of a lake. The implementation plan therefore calls for the collection of additional monitoring data to develop a Lake Characterization Plan for each lake. The plan will consider in-lake measures that need to be taken to supplement the nutrient reduction measures required by the TMDL. In addition, the plans will consider the ecology of the lake and adjust the eutrophication indicator target as necessary to protect the designated uses.

Upon the satisfactory completion of the specific Lake Characterization Plan, the NJEC and/or the Department may announce, through a future RfP, the availability of funds to develop Lake Restoration Plans based upon the completed Lake Characterization Plan Reports. The level of characterization necessary to plan restoration of the lakeshed will be specific to individual lakes depending on the remedial options being considered, and the available data generated from the previous studies and investigations.

**Data Collection:**

All water quality sampling shall be performed in conformance with the Department's Surface Water Quality Sampling Monitoring Protocol, and a Quality Assurance Project Plan (QAPP) must be submitted and approved by the Department prior to the initiation of monitoring. All data should be reported in metric units. Although full development of a QAPP is not required as part of the RfP, a draft QAPP providing a detailed sampling plan, should be developed and submitted with the proposal by the July 5, 2006 deadline. Refer to the format provided in Appendix C.

The following lake information should be gathered, unless already available, which shall then be compiled for the Lake Characterization Plan in order to be able to develop restoration plans at a later date:

Basic physical characteristic of the lake:

- Bathymetric survey
- Lake area and watershed area
- Lake volume
- Depth of unconsolidated sediment

Basic Hydrologic information:

- Measurements of inflows and outflows under normal flow conditions
- Determine the hydrologic balance of the lake

Biological sampling (integrated sample from mixed surface layer), qualitative and quantitative evaluations:

- Algal abundance and composition (greens, diatoms, blue-greens)
- Algal blooms (presence, severity, extent)
- Aquatic vegetation (extent, diversity, invasive species)
- For biomass measurements - Phytoplankton as Chlorophyll *a*: Minimum of 12 samples collected over 4 sampling events (monthly); with samples taken in triplicate per event/site

Note: "Technical Manual for Phosphorus Evaluations for NJPDES Discharge to Surface Water Permits, March 2003" should be referred to for details on biomass measurements. This document may be downloaded from the Department's Division of Water Quality web page at [www.state.nj.us/dep/dwq/techman.htm](http://www.state.nj.us/dep/dwq/techman.htm)

In-lake water quality monitoring:

- 1-5 mid-lake sampling stations as needed to characterize the lake
- Chemistry (TP, SRP, chl-a, NO<sub>3</sub>-N +NO<sub>2</sub>-N, NH<sub>4</sub>-N, TKN, alkalinity, TSS, hardness temperature, DO, pH, conductivity, etc.)
- if applicable, surface, metalimnion, hypolimnion, and bottom sampling if stratified, otherwise surface and bottom or mid-depth.
- At least 2 consecutive days of diurnal dissolved oxygen monitoring (early morning and later afternoon) and to include pH and temperature parameters (hourly throughout the day)
- Secchi depths

When necessary, flow and water quality measurements of influent and effluent streams shall be taken periodically from spring to fall. Fish abundance and composition shall be assessed early autumn.

The following parameters may be considered and included in the scope of work provided justification is given as to the value added for the particular lake:

- Vegetation mapping (for shallow lakes using shore to center transects, measuring density and composition such as emergents, rooted floaters, submergents, free-floating plants, submerged macro-algae)
- Phytoplankton- Zooplankton sampling (abundance, composition and size ranges)
- Fish species and abundance, noting age distribution

### **Water Quality Analysis**

Due to the limitation of the available data, the Department chose an empirical model as the most appropriate means to relate annual phosphorus load and steady-state in-lake concentration of total phosphorus. The Reckhow (1979a) model was selected because the hydrologic, morphological and loading characteristics of the lakes for which TMDLs were developed for were well within the assumptions of the model and because it appeared to give the best predictive results for phosphorus concentration. Please refer to the specific TMDL Report which may be downloaded at [www.state.nj.us/dep/watershedmgt/tmdl.htm](http://www.state.nj.us/dep/watershedmgt/tmdl.htm) for the basis and background for this model selection and application. Using the Reckhow (1979a) model, the Investigator(s) is directed to calculate all loading estimates and revise reductions given in the TMDL for the following sources, as necessary, to achieve target concentration:

- Tributaries loads
- Septic contributions
- Waterfowl
- Internal loads estimate
- Evaluate existing loading coefficients used in the lake TMDL
- Update storm water runoff contributions
- Update total phosphorus source loading
- Identification of storm water/surface water runoff “hot spots”
- Any additional source, provided that the source is more than 2% of the total loadings

Identify Load Reduction Strategies for each of the sources identified above, including but not limited to:

- BMPs—type and location and expected load reduction
- Septic systems—need for source reduction, alternatives to achieve, and expected load reductions
- Internal sources—alternatives to reduce and expected load reductions
- Biological assessments aimed at possible biological manipulation techniques
- Identify data and research gaps required to develop a lake restoration plan and account for cost

**Entities that May Apply for Funding Under the Program:** Entities that may be eligible for funding include, but are not limited to:

- Consultants;
- Municipal planning departments or boards, health departments or boards;
- County planning departments or boards;
- Designated water quality management planning agencies;
- State and federal government agencies;
- Universities and colleges; and
- Watershed and water resource associations and other nonprofit organizations recognized by the Internal Revenue Service under Section 501(c)(3) of the Internal Revenue Code

**Qualifications Needed by Applicant to be Considered for Funding:** In order for the entities noted above to qualify for the Lake Characterization Plan grant funds, they must have:

- Staff and resources with the capability, expertise and environmental experience to perform the proposed work; and
- The ability and authority to develop the Lake Characterization Plan

#### **Prioritization**

Proposals will be reviewed and prioritized for funding based on consideration of the following criteria, which is provided below in no specific order:

- Cost effectiveness, relative to the amount of work being proposed
- Size of the lake e.g. the number of acres
- Amount of work previously conducted on the lake and incorporated in the proposal
- Timeline for proposed Lake Characterization if identified in the TMDL report
- Identification as a State owned lake

#### **Ambient Lake Monitoring Network**

As cited in each of the TMDL reports, the Department has initiated a renewed ambient lake monitoring network designed to provide the water quality data necessary to assess the ecological health of the State's lentic water resource. This program will involve the testing of randomly selected lakes from the state's approximately 1100 named lakes. The water quality measurements conducted at each lake will include parameters such as dissolved oxygen, pH, nutrients, and chlorophyll a. Such testing will assist New Jersey in determining the status and trends in lake water quality, as needed to meet Clean Water Act requirements and TMDL-related water quality assessment obligations. This monitoring effort is independent of this RfP; however this information can be another source of information that *if available* should be included in the Lake Characterization Plan proposal. For additional information on this program, please refer to [www.state.nj.us/dep/wmm/bfbm/lakes.html](http://www.state.nj.us/dep/wmm/bfbm/lakes.html).

#### **Submission of Proposals in Response to RfP:**

All questions regarding the Lake Characterization Plan Request for Proposals should be directed in writing to Lisa Galloway Evrard through electronic mail at [evrard@rci.rutgers.edu](mailto:evrard@rci.rutgers.edu). All proposals shall be submitted in accordance with Appendix B "Procedures for Submitting and Formatting of Proposal." Proposed research must address the topic(s) identified in the RfP. All

proposals must identify the RfP, name of TMDL Report and name of the lake. Ten (10) hard copies and an electronic copy of the proposal shall be sent by the deadline to:

Lisa Galloway Evrard, Program Associate  
Rutgers, New Jersey EcoComplex,  
Environmental Research and Extension Center  
1200 Florence-Columbus Road  
Bordentown, New Jersey 08505-4200  
[evrard@rci.rutgers.edu](mailto:evrard@rci.rutgers.edu)

An electronic copy of the proposal should be created in Adobe Publisher in the PDF Format or MS Word, one-inch margins, 12-point font and single-spaced is preferred. Faxes of proposals and an electronic copy alone will not be accepted as a hard copy of the proposal to meet the deadline. Please include an e-mail address with submission to allow confirmation of receipt of proposal which will be sent via e-mail. Adherence to these procedures is required. Proposals must be submitted to NJEC with a post mark date no later than July 5, 2006 or hand delivered to the location above no later than 5:00 PM on this date in order to be considered for funding.

## **Appendix A      Supporting Documents**

### **TMDL Reports**

The following TMDL reports may be downloaded from New Jersey Department of Environmental Protection – Division of Watershed Management web page at [www.state.nj.us/dep/watershedmgt.tmdl.htm](http://www.state.nj.us/dep/watershedmgt.tmdl.htm)

“TMDL for Phosphorus in Lower Sylvan Lake”, Adopted April 10, 2002

“TMDL for Phosphorus in Strawbridge Lake, Burlington County”, Adopted June 22, 2003

“Total Maximum Daily Loads for Phosphorus to Address 4 Eutrophic Lakes in the Northwest Water Region – Cranberry Lake, Ghost Lake, Lake Hopatcong and Lake Musconetcong”, Approved by EPA 9/17/03

“Total Maximum Daily Loads for Phosphorus to Address 3 Eutrophic Lakes in the Northeast Water Region - Lincoln Park Lakes, Overpeck Lake and Verona Park Lake”, Approved by EPA on 9/17/03

“Total Maximum Daily Loads for Phosphorus to Address 6 Eutrophic Lakes in the Raritan Water Region – Echo Lake, Davidson’s Mill Lake, Devoe Lake, Manalapan Lake, Topanemus Lake and Round Valley Reservoir”, Approved by EPA on 9/30/03

“Total Maximum Daily Loads for Phosphorus to Address 13 Eutrophic Lakes in the Lower Delaware Water Region – Bell Lake, Bethel Lake, Blackwood Lake, Burnt Mill Pond, Giampietro Lake, Harrisonville Lake, Imlaystown Lake, Kirkwood Lake, Mary Elmer Lake, Memorial Lake, Spring Lake, Sunset Lake, Woodbury Lake”, Approved by EPA on 9/30/03.

“Total Maximum Daily Loads for Phosphorus to Address 9 Eutrophic Lakes in the Atlantic Coastal Water Region – Deal Lake, Dennisville Lake, Franklin Lake, Hammonton Lake, Hook’s Creek Lake, Lake Absegami, Lily Lake, Lake Pohatcong and New Brooklyn Lake”, Approved by EPA on 9/30/03.

“TMDL for Phosphorus to Address Greenwood Lake in the Northeast Water Region”, Approved by EPA 9/29/04

“Total Maximum Daily Loads for Total Phosphorus to Address Four Stream Segments and Two Lakes in Cooper River Watershed, Camden County, Lower Delaware Water Region”, Approved by EPA on 9/30/04.

“TMDL to Address Phosphorus in the Clove Acres Lake and Papakating Creek, Northwest Water Region”, Approved by EPA on 9/30/04

### **Lake Support Documents**

The following Lake Support Documents may be downloaded from either the New Jersey Department of Environmental Protection – Division of Watershed Management web page at [www.state.nj.us/dep/watershedmgt](http://www.state.nj.us/dep/watershedmgt) under Publications “Lake Resource Documents” or from the New Jersey Environmental Digital Library at <http://njedl.rutgers.edu/njdlib/index.cfm> type in “lakes” under Quick Searches. The New Jersey Environmental Digital Library uses DjVu software, which you can download for free at <http://www.lizardtech.com/download/>. If after reviewing both web sites and a specific lake support document is not available electronically, please contact the Department’s DWM at (609) 633-1441 to request a hard copy.

An Application for A New Jersey Department of Environmental Protection Lake Management Phase II- Implementation Projects for the Restoration of Blackwood Lake

Cranberry Lake Diagnostic Feasibility Study

Deal Lake Management/Restoration Plan

Diagnostic-Feasibility Study of Bell Lake

Diagnostic-Feasibility Report for Blackwood Lake

Diagnostic-Feasibility Study of Burnt Mill Pond

Diagnostic-Feasibility Report for Dennisville Lake

Diagnostic-Feasibility Study of Giampietro Park Lake

Diagnostic - Feasibility Study of Hooks Creek Lake: Phase I

Diagnostic-Feasibility Study of Pohatcong Lake

Diagnostic-Feasibility Study for the Sylvan Lakes Restoration Project

Franklin Lake Diagnostic Feasibility Study

Hammonton Lake Diagnostic-Feasibility Study: Final Report

Intensive Lake Survey: Echo Lakes

Intensive Lake Survey: Lincoln Park Lakes

Intensive Lake Survey: New Brooklyn Lake

Intensive Lake Survey: Sunset and Mary Elmer Lakes

Intensive Lake Survey: Topanemus Lake

Intensive Lake Survey: Verona Park Lake

Lake Restoration Feasibility Study: Hammonton Lake

New Jersey Lakes Management Program Lakes Classification Study: Bethel Lake

New Jersey Lakes Management Program Lakes Classification Study: Clove Acres

New Jersey Lakes Management Program Lakes Classification Study: Davidson's Mill Lake

New Jersey Lakes Management Program Lakes Classification Study: Kirkwood Lake

New Jersey Lakes Management Program Lakes Classification Study : Lily Lake

New Jersey Lakes Management Program Lakes Classification Study: Manalapan Lake

New Jersey Lakes Management Program Lakes Classification Study: Memorial Lake

New Jersey Lakes Management Program Lakes Classification Study: Overpeck Lake

New Jersey Lakes Management Program Lakes Classification Study: Strawbridge Lake

New Jersey Lakes Management Program Lakes Classification Study: Topanemus Lake

New Jersey Lakes Management Program Lakes Classification Study: Woodbury Lake

Phase 1: Diagnostic-Feasibility Study of Lake Absegami

Phase 1: Diagnostic-Feasibility Study for De Voe Lake Restoration Project

Phase 1: Diagnostic-Feasibility Study of Greenwood Lake, New Jersey and New York

Phase 1: Diagnostic-Feasibility Study of Round Valley Recreational Area

## **Appendix B Procedures for Submitting and Formatting of Proposal**

### **1. PROPOSAL SUBMITTAL PROCEDURE**

All proposals must specify: 1) the RfP; 2) the approved TMDL name; and 3) the lake to be addressed by name. Ten (10) hard copies and an electronic copy of the proposal shall be sent to:

Lisa Galloway Evrard, Program Associate  
Rutgers, New Jersey EcoComplex,  
Environmental Research and Extension Center  
1200 Florence-Columbus Road  
Bordentown, New Jersey 08505-4200  
[evrard@rci.rutgers.edu](mailto:evrard@rci.rutgers.edu)

Electronic copies should be created in Adobe Publisher in PDF format, or in MS Word, one-inch margins, 12-point font and single-spaced is preferred. Please include an e-mail address with submission since confirmation of receipt of proposal will be sent via e-mail.

### **2. PROPOSAL SUBMITTAL DATE**

Proposals must be received by NJEC no later than 5 PM on July 5, 2006. Any proposal received after this date will not be considered for funding.

### **3. PROPOSAL FORMAT**

Proposals should be no longer than twenty (20) pages, not including qualifications and Quality Assurance Project Plan, and must follow the format outlined below:

#### **a) Cover page**

1. Subject and Date of Request for Proposal (RfP) Notification
2. Title of TMDL Report Name
3. Research Agenda Topic (e.g. Development of Lake Characterization Plan for Cranberry Lake)
4. Proposal Title
5. Principal Investigators Name, Affiliation and Contact Information
6. Total Budget
7. Expected time frame to complete work

#### **b) Proposal Overview**

The Proposal Overview is designed to provide a very brief description of the overall intent and direction of the proposed project. This section should be no longer than 2 pages.

1. Research Agenda topic (e.g. (e.g. Development of Lake Characterization Plan for Cranberry Lake)
2. Proposal Title
3. Problem Statement
4. Objective(s)
5. General Methodology Description
6. Expected Products and Applications

**c) Research Proposal**

1. Problem Statement
2. Objective(s)
3. Background and Supporting Literature Review
4. Methods
  - a. Study design including site maps where appropriate
  - b. Detailed description of experimental protocols
  - c. Quality assurance overview (see below)
  - d. Data analyses (e.g., data format, statistical and graphical presentation of data)
5. Dated Schedule of Activities
6. Deliverables or Expected Products – including written reports, computer models, new methodology, etc.
7. References
8. Budget – breakdown of all anticipated expenses

**Timeline Summary (example)**

<b>Task</b>	<b>Description</b>	<b>Project Partners (list all)</b>	<b>Time Frame</b>
<b>I</b>			
<b>II</b>			
<b>III</b>			
<b>IV</b>			
<b>V</b>			

**Budget Summary (example)**

<b>Task</b>	<b>Project Partners and Description</b>	<b>Amount</b>
<b>I</b>		
<b>II</b>		
<b>III</b>		
<b>IV</b>		
<b>V</b>		

**d) Qualifications**

1. Curriculum Vitae (CV) for each investigator or member of the project team who will spend a minimum of 10% of their time on this project (2 page maximum for each)
2. An overall statement of the qualifications of the project team or organization relative to the proposed research (not to exceed 3 pages). This should include client references.

**4. QUALITY ASSURANCE PROJECT PLAN (QAPP)**

Quality assurance shall be incorporated in the planning of a project. While all scientists strive to produce credible results, there is an increasing need for documenting the process of generating, analyzing and validating data. The concepts of Quality Assurance and Quality Control (QA/QC) should be familiar to all scientific disciplines. Quality Assurance (QA) is a management function that is based on review at the planning, implementation, analysis, and completion stages of data collection. Quality Control (QC) is implemented at the field/bench level and it provides details on exactly how data of a specified quality are generated.

Each prospective Investigator shall provide a quality assurance overview of what they expect to accomplish in the proposal by including a preliminary QAPP see recommended format and language provided in Appendix C or through a Quality Assurance Letter. A Quality Assurance Letter may suffice for lakes that are identified with an asterisk where an existing project is currently being conducted under a Department approved QAPP. The existing QAPP should be included with the proposal.

After notification of grant award a detailed QAPP must be submitted by the Investigator within one month after the notification which in turn must be approved by the Department before any work can be initiated. A Quality Assurance Project Plan (QAPP) is required for each parameter in which new data will be collected or generated.

## **Appendix C**

### **Quality Assurance Project Plan (QAPP) Lake Characterization Plan for (name of Lake)**

Prepared by: \_\_\_\_\_ Date: \_\_\_\_\_

Reviewed by: \_\_\_\_\_ Date: \_\_\_\_\_

Reviewed by: \_\_\_\_\_ Date: \_\_\_\_\_

Reviewed by: \_\_\_\_\_ Date: \_\_\_\_\_

Approved by: \_\_\_\_\_ Date: \_\_\_\_\_

Marc Ferko, Quality Assurance Officer  
NJDEP, Office of Quality Assurance

**Quality Assurance Project Plan  
For (Name of Lake)  
(Name of County), New Jersey**

**Submitted to:**

Rutgers, New Jersey EcoComplex  
Environmental Research and Extension Center  
1200 Florence-Columbus Road  
Bordentown, New Jersey 08505-4200

And

New Jersey Department of Environmental Protection  
Division of Watershed Management  
PO Box 418  
Trenton, New Jersey 08625-0418

**Submitted by:**

**Prepared by:**

**Date:**

**Project Name:**

**Project Requested by:**

**Project Manager:**

**Address:**

**Phone:**

**QA/QC Officer Name:**

**Address:**

**Phone:**

**Project Description:**

**A. Scope of Work Statement and Objectives**

The specific tasks for the proposed project include (for example):

1. Update the bathymetry of the lake
2. Collect basic hydrologic information to develop hydrologic budget for the lake
3. Implement a (#) year water quality monitoring program that includes a total of (#) in-lake monitoring events
4. Quantify an annual pollutant budget, which addresses total phosphorus, total nitrogen and total suspended solids
5. Evaluate the targeted phosphorus load relative to the establishment of clear water state
6. Conduct a feasibility analysis to identify potential in-lake watershed based management techniques
7. Assess and identify site-specific phosphorus load reduction strategies

**B. Date Usage** (example language provided):

The data collected for Lake Characterization Plan will support the eventual development of a Lake Restoration Plan for (name of Lake) and its lakeshed.

**C. Sampling Procedures** (example language provided)

All sampling procedures shall be in conformance with standards limnological practices and procedures listed in “Standards Methods for the Examination of Water and Wastewater, (21<sup>st</sup> Edition)” (American Public Health Association, et al., 2005), State Protocol (NJDEP, 2005) and/or any applicable US EPA guidance document. Instrumentation used for the collection of

field data (dissolved oxygen, temperature, pH and conductivity) shall be properly calibrated in conformance with manufacturer instructions. All sampling sites were chosen to be representative sites and are subject to approval by the New Jersey Department of Environmental Protection, Rutgers New Jersey EcoComplex and (name of Project Requestor).

The methodology for the biological parameters, such as chlorophyll *a*, are described in “Standard Methods for the Examination of Water and Wastewater (21<sup>st</sup> Edition)” (American Public Health Association, et al., 2005) and in “Limnological Analyses”, Third Edition (Wetzel and Likens, 2000).

#### **D. Water Quality Monitoring Parameters and Frequency**

(This section would be fleshed out in detail upon approval of contract; however some description of parameters that are proposed to be collected, sampling locations, monitoring frequency and why particular parameter is being collected is warranted to support the cost and scope of the project proposal).

Note: Monitoring should reflect the actual level of work commensurate with the preparation of a Lake Characterization Plan - the use of existing data may preclude the need to collect all of the parameters listed in the parameter table below.

**Parameter Table** (example provided – The final table would be fleshed out in detail upon approval of contract and should be prepared in consultation with the state certified analytical laboratory that will be engaged to perform the analyses).

Parameter	Analytical Method Reference* (Standard Methods)	Sample Container and Preservation Method	Holding Time (Maximum)
Soluble Orthophosphate	4500- P E	1 pint plastic, filter, cool to 4°C	48 hours
Total Phosphorus	4500-P B-5 and 4500-P E	1 pint plastic, H <sub>2</sub> SO <sub>4</sub> added to pH <2, cool to 4°C	28 days
Total Dissolved Phosphorus	4500-P B-5 and 4500-P E	1 pint plastic, filter, H <sub>2</sub> SO <sub>4</sub> added to pH <2, cool to 4°C	28 days
Nitrate-N + Nitrite-N	419D/4500 NO <sub>2</sub> B EPA 354.1/352.1	1 pint plastic, cool to 4 EC	48 hours
Ammonia - N	4500 – NH <sub>3</sub> B	1 pint plastic, H <sub>2</sub> SO <sub>4</sub> added to pH <2, cool to 4 EC	28 days
Total Kjeldahl Nitrogen	4500orgBC	1 pint plastic, H <sub>2</sub> SO <sub>4</sub> added to pH <2, cool to 4 EC	28 days
Alkalinity	2320	1 pint plastic, filter, cool to 4°C	14 days
Total Hardness	2340C	1 pint plastic, HNO <sub>3</sub> added to pH <2, cool to 4°C	6 months

Total Suspended Solids	2540 D	1 pint plastic, cool to 4° C	7 days
Conductivity Profile	2510 B	<i>in situ</i>	N/A
pH Profile	4500-H <sup>+</sup> B	<i>in situ</i>	N/A
Dissolved Oxygen Profile	4500-O G	<i>in situ</i>	N/A
Temperature Profile	2500 B	<i>in situ</i>	N/A
Chlorophyll <i>a</i>	10200 H 1 & 2	1 quart plastic, the filter in field, freeze at 20°C	N/A

\* As per Standard Methods (American Public Health Association et al., 1998).

Note: Monitoring should reflect the actual level of work commensurate with the preparation of a Lake Characterization Plan - the use of existing data may preclude the need to collect all of the parameters listed in the example above.

**Information on Detection Limits, Precision and Accuracy for Discrete Water Quality Parameters** e.g. parameter detection limits, quantification limits, accuracy and precision – (This section to be completed upon approval of contract. A table should be prepared in consultation with a state certified licensed analytical laboratory that will be engaged to perform the analyses).

**Information on Detection Limits, Precision and Accuracy for *In-Situ* Parameters** (This section to be completed upon approval of contract).

**Proposed Schedule of Sampling Events for the Monitoring Program of (Name of Lake)**

Sampling Year	April	May	June	July	August	September
2007						
2008						

Note: Table to be completed upon approval of contract.

**Chain of Custody Procedures** (example language provided - This section to be finalized upon approval of contract and should be prepared in consultation with the state certified analytical laboratory that will be engaged to perform the analyses).

Chain of custody procedures will be utilized once the samples are collected and transported to the laboratory for analysis. Personnel responsible for sampling operations will inform the analytical laboratory at least (#) hours in advance of the date that the lake monitoring samples will be delivered.

The sample collector will be required to record the following information on the sampling container and field data sheets: (for example) sample number and/or station, date and time of collection, source, preservation technique and collector's name. The sample collector will also record pertinent field data, field observations and the analyses required on the field data sheets. A chain of custody form will be completed to identify the analyses requested and will be submitted to the laboratory at the time of sample delivery.

Following collection, samples will be placed on ice in an insulated container for transport to the laboratory. The sample collector or (name of person/organization) will deliver the samples to the laboratory, where laboratory personnel will visually inspect all samples containers to confirm the method transportation, date of collection and preservation techniques. Samples will not be accepted and fresh samples will be requested if for any reason the holding time was exceeded, proper preservation techniques were not followed or transportation conditions were unsuitable.

**Calibration Procedures and Preventative Maintenance** (This section to be finalized upon approval of contract and should be prepared in coordination with the state certified analytical laboratory that will be engaged to perform the analyses).

Field equipment will be calibrated on each sampling date in accordance with the manufacturer's instructions. Any problems will be corrected before samples are collected.

### **Documentation, Data Reduction and Reporting**

All QA/QC data and project information will be collected according to applicable State and federal regulations. All data will be included in the final Lake Characterization Plan report and will be kept on file by the Investigator for a minimum of five years.

### **Data Validation**

Data validation will be performed by the (name of Investigator) and will be provided with the final report. If blank contamination is found in the equipment rinse blank, all water quality data with results less than five (5) times the concentration found in the blank should be flagged "B". The B qualifier indicates that the reported results may be an anomaly as a result of contamination of the blank.

### **Performance and Systems Audits**

#### **A. Performance Auditing (example language provided)**

(Name of Lab) is certified by the State of New Jersey (certification #) to perform analyses of water samples. The laboratory participates in performance Evaluation (PE) Studies for each category of certification and accreditation is required to pass these PE studies in order to maintain certification. The Department conducts performance audits of each laboratory that is certified or accredited.

(Name of Lab) also participated in several additional programs to ensure data accuracy. The laboratory participates in US EPA water pollution and water supply studies and the discharge monitoring report (DMR QA/QC) program.

#### **B. Systems Auditing**

The Department periodically conducts on-site Technical Systems Audits (TSA) of each certified laboratory. The findings of these audits, together with the US EPA Performance Evaluation results, are to be used to update each laboratory's certification status.

### **Corrective Action**

The project QA Officer will ensure that all data for the project are generated in accordance with the procedures outlined in the QAPP. Quality control samples will be analyzed with each sample batch and results will be provided with the data reports. If a QC sample provides unacceptable results during and given day, the sample analysis must be repeated for those parameters affected. All project participants will immediately report and deficiencies to the QA Officer. The QA Officer will recommend appropriate corrective action and determine the acceptability of affected data when deficiencies are noted.

The QA Officer will notify the Project Director of any unacceptable data to ensure that it is not included in evaluations of water quality for reporting purposes. The QA Officer shall notify the Project Director in writing anytime a deviation from the approved QAPP occurs. Results of all corrective actions will then be documented.

### **Example References**

American Public Health Association, American Water Works and Water Environment Federation, 2005 *Standard Methods for the Examination of Water and Wastewater*, 21st Edition, Washington, D.C.

Maidment, D.R. 1993 *Handbook of Hydrology*. McGraw-Hill, New York

New Jersey Department of Environmental Protection and Energy, 1992. *Field Sampling Procedures Manual*, Trenton, New Jersey

New Jersey Department of Environmental Protection, March 2003. *Technical Manual for Phosphorus Evaluations for NJPDES Discharge to Surface Water Permits*, Division of Water Quality, Trenton, New Jersey

New Jersey Department of Environmental Protection (date) *Amendment to (name) Water Quality Management Plan, Total Maximum Daily Loads for (name)* Division of Watershed Management, Trenton, New Jersey

United States Environmental Protection Agency. 1980 *Clean Lakes Program Guidance Manual*. Report No. EPA 440/5-81-003. USEPA, Washington, D.C.

Wetzel, R.B. and G.E. Likens. 2000 *Limnological Analyses*, Third Edition Springer-Verlag. New York.